



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4125

May 9, 2011

Matthew Sunseri, President and
Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

Subject: WOLF CREEK GENERATING STATION – NRC INTEGRATED INSPECTION
REPORT 05000482/2011002

Dear Mr. Sunseri:

On March 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Wolf Creek Generating Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 7, 2011, with you and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the NRC has identified 11 issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has determined that violations are associated with all of these issues. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violations or the significance of the noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the facility. In addition, if you disagree with the crosscutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at the facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one for cases where a response is not required, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

Geoffrey B. Miller
Chief, Project Branch B
Division of Reactor Projects

Docket No. 50-482
License No. NPF-42

Enclosure:
NRC Inspection Report 05000482/2011002
w/Attachment: Supplemental Information

Distribution via Listserv

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CLong	CPeabody	BTindell	DReinert
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C:DRS/EB1	C:DRS/EB2	C:DRS/PSB	C:DRS/OB
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000482

License: NPF-42

Report: 05000482/2011002

Licensee: Wolf Creek Nuclear Operating Corporation

Facility: Wolf Creek Generating Station

Location: 1550 Oxen Lane NE
Burlington, Kansas

Dates: January 1 to March 31, 2011

Inspectors: C. Long, Senior Resident Inspector
B. Tindell, Acting Senior Resident Inspector
J. Drake, Senior Reactor Inspector
C. Peabody, Resident Inspector
D. Reinert, Acting Resident Inspector
C. Smith, Reactor Inspector
A. Fairbanks, Reactor Inspector
G. Guerra, CHP, Emergency Preparedness Inspector
L. Carson II, Senior Health Physicist
C. Alldredge, Health Physicist

Approved By: G. Miller, Chief, Project Branch B
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000482/2011002, 1/1/2011 – 3/31/2011; Wolf Creek Generating Station, Integrated Resident and Regional Report; Equipment Alignment, Maintenance Effectiveness, Operability Determinations and Functionality Assessments, Postmaintenance Testing, Refueling and Other Outage Activities, Surveillance Testing, and Radiological Hazard Assessment and Exposure Controls.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. Eleven Green noncited violations of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. **NRC-Identified Findings and Self-Revealing Findings**

Cornerstone: Initiating Events

Green. The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow the requirements of Procedure AP 21E-001, "Clearance Orders." This procedure violation resulted in an inadequate tagout for the Train A solid state protection system resulting in an unplanned swap of the volume control tank charging pump suction to the reactor water storage tank and an unplanned entry into Technical Specification 3.4.12 due to the de-energization of power operated relief valve A low temperature overpressure protection relays. Operators took manual actions to restore the pump suction, and power was restored after approximately four hours. This finding has been entered into the licensee's corrective action program as Condition Reports 35288 and 35318.

The failure to follow procedures to complete clearance orders with adequate boundaries is a performance deficiency. The performance deficiency was more than minor because it impacted the Initiating Events Cornerstone objective of configuration control to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The significance of the finding was determined using Inspection Manual Chapter 0609, Significance Determination Process, Appendix G, Checklist 2, and determined to be of very low safety significance, because it did not cause the loss of mitigating capability of core heat removal, inventory control, power availability, containment control, or reactivity control. Additionally, the cause of the finding is related to the human performance crosscutting component of work control. Specifically, the licensee did not appropriately plan for the maintenance work scope by

ensuring work groups and an offsite organization communicate the necessary electrical boundaries to assure plant and human performance [H.3(b)] (Section 1R20).

Cornerstone: Mitigating Systems

Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to assure that applicable regulatory requirements and the design basis were met. Specifically, the licensee failed to ensure that the fuel oil storage tank fill system minimized turbulence, as required by the Updated Safety Analysis Report, such that the emergency diesel generators can be refueled while running uninterrupted. The licensee entered this issue in the corrective action program and will develop corrective actions as part of Condition Report 34730.

The failure to establish measures to assure that applicable regulatory requirements and the design basis are met was a performance deficiency. The performance deficiency was more than minor because it impacted the Mitigating Systems Cornerstone attribute of design control and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding had very low safety significance because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and adopt a requirement to demonstrate the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action [H.1(b)] (Section 1R04).

Green. The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a involving the failure to properly implement the clearance order procedure resulting in a failure to provide adequate cooling to inservice safety-related equipment. Operators restored cooling water flow after approximately one hour. The licensee entered the finding into their corrective action program as Condition Report 33357.

The inspectors determined that the failure to ensure that plant conditions could support establishing the clearance order boundaries, which resulted in a component cooling water heatup and trip of the inservice control room air conditioner, was a performance deficiency. The inspectors determined that this finding was more than minor because it is associated with the configuration control attribute for the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because it was confirmed not to result in loss of operability of control room

air conditioning Train B for greater than its technical specification allowed outage time and it did not result in the loss of the normal service water function for greater than 24 hours. This finding has a crosscutting aspect in the area of human performance associated with work control because the licensee failed to plan the work activity by incorporating the impact on the plant [H.3(a)] (Section 1R04).

Green. The inspectors identified a noncited violation of 10 CFR 50.65(a)(1) with three examples involving the failure to monitor the performance of stand by nonsafety-related systems and components that exceeded performance criteria against goals. First, the inspectors identified that the licensee failed to monitor the turbine-driven main feedwater pumps against their standby restart function to fill the steam generators in emergency operating procedures. Failures of the two turbine-driven main feedwater pumps occurred which could have prevented fulfillment of this function. Second, the inspectors identified that the licensee failed to evaluate reactor trips caused by the main feedwater system against the system's plant level monitoring criteria. Third, the inspectors identified that the licensee failed to monitor the instrument air compressor system against its emergency operating procedure function to restart and provide compressed air. Several instrument air compressor trips have occurred in the last 18 months which could have prevented fulfillment of this function. The licensee entered this issue in the corrective action program and will develop corrective actions as part of Condition Report 36600.

The failure to establish performance monitoring goals commensurate with the mitigating safety function specified in the emergency operating procedures and the plant level criteria is a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it impacts equipment performance attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Using the NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding screened to a Phase 2 significance determination because it involved a potential loss of safety function of the main feedwater system and failure of the instrument air system. A Region IV senior reactor analyst performed a Phase 2 significance determination and using the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Wolf Creek," Revision 2.01a; however, the presolved worksheet did not include the simultaneous failure of multiple components in different systems. Therefore, the senior reactor analyst performed a bounding Phase 3 significance determination using Appendix M of Inspection Manual Chapter 0609, "Significance Determination Process Using Qualitative Criteria," Section 4.1.2. The analyst determined that the finding was of very low safety significance (Green). The bounding change to the core damage frequency was approximately $8 \text{ E-}7/\text{year}$. The relatively low risk worth of the instrument air system at Wolf Creek helped to mitigate the significance. To evaluate the change to the large early release frequency (LERF), the analyst used Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process." The finding screened as having very low safety significance for LERF because it did not affect the intersystem loss of coolant accident or steam generator tube rupture categories. The inspectors determined that the finding had a crosscutting aspect in the area of problem

identification and resolution. Specifically, when Wolf Creek evaluated exceeding the plant level monitoring criteria for reactor trips, their analysis did not identify that failures within the main feedwater system were the cause of four of the six reactor trips, and did not place the affected system function in a(1) monitoring [P.1(c)] (Section 1R12).

Green. The inspectors identified a noncited violation of 10 CFR 50.65 a(2), involving the failure to demonstrate that the performance of main control board annunciator power supplies was effectively controlled through preventive maintenance such that the annunciators remained capable of performing their intended function. The licensee entered this issue into the corrective action program and will develop corrective actions as part of Condition Report 34681.

The failure to properly evaluate the failed main control board annunciator power supplies, establish performance goals, and monitor their performance is considered a performance deficiency. This finding is more than minor because it is associated with the Mitigating Systems Cornerstone attribute of equipment performance and it adversely affects the cornerstone objective ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding is determined to have very low safety significance since it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding was determined to have a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to properly classify, prioritize, and evaluate a condition adverse to quality [P.1(c)] (Section 1R12).

Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, involving an inadequate calculation supporting vital switchgear room temperatures with only one vital switchgear cooler operable. The licensee entered this issue in the corrective action program and will develop corrective actions as part of Condition Reports 27276, 28252, and 31452.

The inspectors considered the inadequate heat loads and assumptions used in calculation GK-06-W to be a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it impacted with the equipment performance attribute of the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors screened the finding to Green because the additional temperatures would not have caused the loss of functionality of vital switchgear or batteries, and it did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. No crosscutting aspects were identified because the supporting documentation was prepared in the late 1990s and was not representative of current licensee performance (Section 1R15).

Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, involving the failure to follow plant procedures. Specifically, the licensee failed to follow procedure and perform an operability determination when a nonconforming or degraded condition was identified in the Train B emergency diesel generator fuel oil storage tank, as required by Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21. The licensee subsequently performed an operability determination and concluded the fuel oil storage tank was operable but degraded. The licensee entered this issue in the corrective action program as Condition Reports 33355 and 34068.

The failure to follow Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21, when a nonconforming or degraded condition was identified was a performance deficiency. This performance deficiency was more than minor because it could become a more significant safety concern if left uncorrected. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding had very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee failed to thoroughly evaluate problems, including evaluating for operability, such that the resolution addressed the cause [P.1(c)] (Section 1R15).

Green. The inspectors identified a noncited violation of 10 CFR Part 50 Appendix B, Criterion III, involving a failure to perform periodic testing to verify that ultimate heat sink sedimentation remained within design basis limits. The licensee subsequently verified the ultimate heat sink depth remained acceptable using SONAR. The licensee entered this issue in the corrective action program as Condition Report 27144.

Wolf Creek's failure to perform periodic testing to verify that ultimate heat sink sedimentation remained within design basis limits is a performance deficiency. The issue is more than minor, and therefore a finding, because if left uncorrected the issue has the potential to become a more significant safety concern. The inspectors concluded that the issue screened to Green under the significance determination process using Inspection Manual Chapter 0609.04, "Phase 1-Initial Screening and Characterization of Findings," because the finding was a design deficiency that was later confirmed not to result in the loss of operability or functionality of the ultimate heat sink. The inspectors concluded that this finding's cause has a crosscutting aspect in the area of human performance associated with the work control component because Wolf Creek did not appropriately coordinate work activities by incorporating actions to address the impact of changes to the work scope or activity on the plant and human performance. Specifically, when Wolf Creek performed and planned dredging preventive maintenance on the ultimate heat sink, they did not consider the need to confirm as-found and as-left sediment depth to verify that their design basis was met [H.3(b)] (Section 1R19).

Green. The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to perform an adequate fill and vent of the component cooling water system which resulted in voiding of the system. The licensee entered the finding into their corrective action program and will develop corrective actions as part of Condition Report 33925.

The inspectors determined that the failure to perform an adequate fill and vent of component cooling water that resulted in system voiding was a performance deficiency. The inspectors determined that this finding was more than minor because it is associated with the human performance attribute of the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to take appropriate corrective actions from previous voiding events [P.1(d)] (Section 1R19).

Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow Procedure AP 21-001, "Conduct of Operations." Specifically, the licensee failed to enter into technical specification limiting condition of operation 3.7.5.B.1 for one auxiliary feedwater pump inoperable during performance of 92-day check valve surveillance tests. Wolf Creek took prompt corrective action to amend the procedures to include instructions for maintaining the pumps operable with manual actions. This occurred prior to the next check valve test. This issue is captured in Condition Report 34469.

The failure to enter technical specification action statements in accordance with Procedure AP 21-001 was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it impacted with the human performance attribute of the Mitigating Systems Cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the issue did not result in a loss of operability for a time period greater than the action statement, and did it not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the finding has a crosscutting aspect in the area of human performance associated with decision making. Specifically, informally maintained pre-job briefing sheets were being relied upon to determine technical specification applicability instead of the licensee's decision making process of operator review on a case by case basis [H.1.a.] (Section 1R22).

Cornerstone: Occupational Radiation Safety

Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow procedure requirements related to adding work to existing radiation work permits. Specifically, welding was performed in a locked high radiation area on radiation work permit 110039, which did not cover that type of activity. The licensee placed the finding into the corrective action program as Condition Report 35522 and acknowledged that the radiation work permit used was inappropriate for the work completed.

The failure to follow a procedure was a performance deficiency. The finding was more than minor because it negatively impacted the Occupational Radiation Safety Cornerstone's attribute of program and process, in that the inappropriate use of a radiation work permit led to workers' unplanned and unintended dose. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance because: (1) it was not associated with ALARA planning or work controls, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. This deficiency had a crosscutting aspect in the area of human performance related to work controls. Specifically, there was inappropriate coordination and communication of work activities between work groups [H.3.b] (2RS01).

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and condition report numbers are listed in Section 4OA7.

REPORT DETAILS

Summary of Plant Status

Wolf Creek began the inspection period at 100 percent power. On January 6, 2011, Wolf Creek decreased reactor power to 97 percent to perform testing on the auxiliary feedwater pump Train A. Wolf Creek resumed operation at 100 percent power the same day. Wolf Creek commenced an orderly shutdown for a scheduled refueling outage on March 18, 2011. The reactor shutdown was completed March 19, 2011, and Wolf Creek ended the inspection period in a refueling outage.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk significant systems:

- January 5, 2011, Chemical and volume control system during tagout for vent valve leakage
- January 20, 2011, Emergency diesel generator A while emergency diesel generator B was inoperable
- February 3, 2011, Emergency diesel generator fuel oil system
- February 28, 2011, Essential service water Train A after essential service water Train B was inadvertently isolated

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Safety Analysis Report (USAR), technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned

correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

a. Findings

- .1 Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to assure that applicable regulatory requirements and the design basis were met. Specifically, the licensee failed to ensure that the fuel oil storage tank fill system minimized turbulence, as required by the Updated Safety Analysis Report, such that the emergency diesel generators can be refueled while running uninterrupted.

Description. The Wolf Creek USAR requires, in part, that the addition of fuel oil to the fuel oil storage tanks be done in a way that minimizes the creation of turbulence such that the emergency diesel generators can be refueled while running uninterrupted, consistent with Regulatory Guide 1.137. Turbulence has the potential to stir up sediment which could cause the overall quality of fuel oil in the storage tank to become unacceptable and clog engine fuel oil filters.

The NRC examined this issue during plant licensing. NRC question 430.14, as stated in the USAR, proposed two alternatives for minimizing turbulence:

1. Design a fuel oil storage tank fill system that will minimize turbulence in the tank.
2. Cross connect the fuel oil storage tank of each diesel in a manner that will permit supply of fuel oil to either engine from either tank. In this manner, one tank could be filled while the other tank supplies fuel to the operating diesel generator. After filling the tank, fuel would not be drawn from the tank for a period of time to permit settling of sediment.

From the period of initial operation to 2001, Wolf Creek utilized the cross-connect lines to allow for the settling of sediment when filling the diesel storage tanks (alternative 2) which would not interrupt operation of either engine. Originally, the cross-connect lines were tested by technical specification surveillance requirement 4.8.1.1.2g.10. Wolf Creek converted from Westinghouse standard technical specifications to improved technical specifications in 1999, at which point this surveillance requirement was moved to the licensee controlled USAR.

After the conversion to improved technical specifications, USAR Section 9.5.4.4 stated, "A verification that the fuel oil transfer pump is capable of transferring fuel oil from each

fuel oil storage tank to the day tank of the opposite train via the installed cross-connect line is performed every 18 months during a refueling outage.” However, a series of performance improvement requests (PIR), were written to address the fact that there were no operating procedures for cross tying the fuel oil storage tanks. PIR 2001-1104 provided the justification for the deletion of surveillance Procedure STN JE-002, “Emergency Fuel Oil System Crosstie Flow Test”, and the applicable portion of USAR Section 9.5.4.4. PIR 2001-1104 stated the fuel oil storage tank was, in fact, designed to minimize turbulence during filling operations (alternative 1 of NRC question 430.14). The inspectors questioned how the licensee was in compliance with Regulatory Guide 1.137, as endorsed by the USAR, with the deletion of requirements for cross tying the fuel oil storage tanks when no other physical changes or analyses were performed. PIR 2001-1104 identified that another plant modified its fuel oil fill lines to minimize turbulence consistent with Regulatory Guide 1.137; however, Wolf Creek did not adopt similar changes.

On March 7, 2011, the licensee generated engineering disposition Condition Report 30468 which stated that Wolf Creek, “Does not have a calculation to evaluate the hydraulic effects of the fuel oil filling the tank. However, the ‘churning’ and buoyancy [sic] effects on the sediment of 2 gallons per second falling less than 15 feet into 6,694 gallons (initially) of fuel oil is judged to be minimal.” The inspectors determined that the qualitative statements provided inadequate justification for asserting the design of the fill system minimizes turbulence. The inspectors further identified USAR Section 9.5.4.2.1 states, “System operation provides flow to motivate water toward sump, tank replenishment provides similar motive force.” The inspectors concluded that the fill system was not designed to minimize turbulence, and the licensee’s justification that the design prevented turbulence lacked an adequate technical basis. The licensee initiated Condition Report 34730 which will restore compliance with the USAR and Regulatory Guide 1.137.

Analysis. The failure to establish measures to assure that applicable regulatory requirements and the design basis are met was a performance deficiency. The performance deficiency was more than minor because it impacted the Mitigating Systems Cornerstone attribute of design control and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding had very low safety significance because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and adopt a requirement to demonstrate the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action [H.1(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, from 2001 until 2011, the measures established by the licensee failed to assure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to ensure the fill system for the fuel oil storage tanks minimized the creation of turbulence to ensure that emergency diesels run without interruption, as required by the USAR, consistent with Regulatory Guide 1.137. Because this violation was of very low safety significance and was entered into the licensee's corrective action program (Condition Report 34730), this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000485/2011002-01, "Inadequate Design Control of the Fuel Oil Storage Tank Fill System."

- .2 Introduction. The inspectors reviewed a Green self-revealing noncited violation of Technical Specification 5.4.1.a involving the failure to properly implement the clearance order procedure resulting in a failure to provide adequate cooling to inservice safety-related equipment.

Description. On February 10, 2011, operations personnel isolated Train B essential service water return to the ultimate heat sink in preparations for motor-operated valve testing in accordance with clearance order D-EF-B-021. Approximately 10 minutes after the return line was isolated, operations personnel in the control room noted that the temperature of some components was unexpectedly increasing. Operations personnel then determined that all service water cooling to Train B had been lost due to the isolation of the ultimate heat sink return line and restored cooling water flow. The licensee initiated Condition Report 33357 to document the error.

Licensee personnel who had planned the work and prepared and authorized the ultimate heat sink return line isolation failed to consider that the normal service water system uses the ultimate heat sink return line to return water to the lake during the winter. As a result, when the return line was isolated, flow through various Train B heat exchangers was isolated for approximately one hour. Equipment that lost cooling included inservice Train B mitigation equipment, such as component cooling water, all Train B pump room coolers, containment air coolers, the vital switchgear air conditioner, and the control room air conditioner.

Analysis. The inspectors determined that the failure to ensure that plant conditions could support establishing the clearance order boundaries, which resulted in a component cooling water heatup and trip of the inservice control room air conditioner, was a performance deficiency. The inspectors determined that this finding was more than minor because it is associated with the configuration control attribute for the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because it was confirmed not to result in loss of

operability of control room air conditioning Train B for greater than its technical specification allowed outage time and it did not result in the loss of the normal service water function for greater than 24 hours. This finding has a crosscutting aspect in the area of human performance associated with work control because the licensee failed to plan the work activity by incorporating the impact on the plant [H.3(a)].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires that written procedures be established and implemented covering activities specified in Appendix A, "Typical Procedures for Pressurized Water Reactors," of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," February 1978. Regulatory Guide 1.33, Appendix A, Section 1, requires, in part, that the licensee control equipment (e.g. locking and tagging) in accordance with written instructions. Wolf Creek Procedure AP 21E-001, "Clearance Orders," Revision 26, is used for equipment control. Step 5.11.2 of Procedure AP 21E-001, requires, in part, ensuring that plant conditions support establishing the clearance order boundaries. Contrary to the above, on February 10, 2011, the licensee implemented clearance order D-EF-B-021 without ensuring that plant conditions supported establishing the clearance order boundaries. Specifically, the clearance order boundary inadvertently isolated cooling water to inservice safety-related equipment. Because of the very low safety significance of this finding and because the licensee entered this issue into the corrective action program as Condition Report 33357, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-02, "Inadequate Clearance Order Isolated Cooling to Inservice Train B Safety-Related Equipment."

.2 Complete Walkdown

a. Inspection Scope

On March 28, 2011, the inspectors performed a complete system alignment inspection of the spent fuel pool cooling system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk significant plant areas:

- January 27, 2011, Fire Area A2
- January 27, 2011, Fire Area A4
- February 7, 2011, Fire Area F15
- February 7, 2011, Fire Area F17

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's individual plant examination of external events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On February 18, 2011, the inspectors observed essential service water Train B cable vaults to verify the cables were not submerged. In addition, the inspectors observed the material condition of the cable supports. The inspectors reviewed the licensee's efforts to maintain the cables in a qualified environment. The inspectors reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems.

These activities constitute completion of one bunker/manhole sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors reviewed licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for the component cooling water heat exchangers. The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; the licensee utilized the periodic maintenance method outlined in EPRI Report NP 7552, "Heat Exchanger Performance Monitoring Guidelines"; the licensee properly utilized biofouling controls; the licensee's heat exchanger inspections adequately assessed the state of cleanliness of their tubes; and the heat exchanger was correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one heat sink inspection sample as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On February 10, 2011, the inspectors observed a crew of licensed operators perform a shutdown to Mode 5 in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and

training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- February 16, 2011, NF-01, Load shedding and emergency load sequencer
- March 3, 2011, AE-01, Main feedwater pump supply to steam generators
- March 8, 2011, AD-04, Condensate pump discharge to main feed suction
- March 9, 2011, KA-01, Instrument air compressors
- March 21, 2011, RK-01, Main control board annunciators and power supplies

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and

independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or (a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

- .1 Introduction. The inspectors identified a Green noncited violation of 10 CFR 50.65(a)(1) with three examples involving the failure to monitor the performance of standby nonsafety-related systems and components that exceeded performance criteria against goals. First, the inspectors identified that the licensee failed to monitor the turbine-driven main feedwater pumps against their standby restart function to fill the steam generators in emergency operating procedures. Failures of the two turbine-driven main feedwater pumps occurred which could have prevented fulfillment of this function. Second, the inspectors identified that the licensee failed to evaluate reactor trips caused by the main feedwater system against the system's plant level monitoring criteria. Third, the inspectors identified that the licensee failed to monitor the instrument air compressor system against its emergency operating procedure function to restart and provide

compressed air. Several instrument air compressor trips have occurred in the last 18 months which could have prevented fulfillment of this function.

Description. Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," provides industry guidance for compliance with 10 CFR 50.65, "The Maintenance Rule." This regulatory guide endorses NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2, with some exceptions as specified in the regulatory guide. The scope of 10 CFR 50.65 includes nonsafety-related components that are utilized in emergency operating procedures.

The inspectors reviewed the main feedwater system maintenance rule functions and scoping. Function AE-01 requires feedwater to the steam generators using only turbine-driven main feedwater pumps. This function monitors nonsafety equipment which could cause a plant trip or actuation of safety-related systems, as well as for a nonsafety-related function which is used in the emergency operating procedures to provide accident mitigation. Function AE-01 monitored the steam-driven pumps at the plant level and was in a(2) status. The inspectors identified that the steam-driven main feed pumps were not monitored for their emergency operating procedure function, per the AE-01 scoping. The licensee had concluded that the emergency operating procedure function for the steam-driven main feedwater pumps was not subject to monitoring under the maintenance rule because it did not perform a significant fraction of the mitigating function (i.e., it was not risk significant) in accordance with Section 1.1.2 of Regulatory Guide 1.160. The inspectors reviewed the regulatory guide and determined that Wolf Creek had improperly applied the guidance. Section 1.1.2 of Regulatory Guide 1.160 requires that all equipment that is explicitly addressed in the emergency operating procedures be monitored for maintenance effectiveness. Regulatory Guide 1.160 specifies that only equipment that is not explicitly addressed, but the use of which is implied, may be excluded on the basis of risk. The inspectors concluded that the exclusion of the turbine-driven main feedwater pumps based on risk consideration was not appropriate since the pumps are explicitly identified to mitigate an accident in emergency operating Procedure FR-H1, step 14.

The inspectors performed additional inspection samples of Wolf Creek maintenance rule functions and identified that additional standby mitigating components explicitly referenced in the emergency operating procedures were not being monitored for the following systems:

- Condensate pumps – function AD-04
- Instrument air compressors – function KA-01
- Non-IE electrical – functions PA-01, PB-01, PG-01, PK-01, and SL-01

The inspectors reviewed the equipment history over the past 3 years for these systems and found that the instrument air compressors had a history of component failures due to maintenance practices, most notably repetitive lube oil pressures and levels being out of specification, leading to subsequent failures. The inspectors identified seven compressor demand failures between November 18, 2008, and March 1, 2011, but no

maintenance rule functional failure evaluations were performed. The inspectors concluded the licensee had failed to appropriately monitor the performance of the instrument air compressors' standby emergency restart function

Regulatory Guide 1.160, Section 1.7.1, "Plant Level Cause Determinations," states, in part, for all structures, systems or components that are being monitored using plant level performance criteria, a cause determination is required whenever any of these performance criteria are exceeded in order to determine which structure, system or component caused the criterion to be exceeded or whether the failure was a repetitive maintenance preventable functional failure. As part of the cause determination, it would also be necessary to determine whether the structure, system or component was within the scope of the maintenance rule and, if so, whether corrective action and monitoring (tracking, trending, and goal setting) under 10 CFR 50.65(a)(1) should be performed. Wolf Creek plant level criteria has been in a(1) status for reactor trips since May 13, 2010. Over the past 3-year monitoring period, Wolf Creek has experienced the following reactor trips:

- March 17, 2008, XPB03 13.8kV transformer failure
- April 28, 2009, Main feed regulating valve closure due to fuse failure
- August 19, 2009, Loss of offsite power
- March 2, 2010, Main feed pump A trip due to PN09 bus failure
- March 8, 2010, Main feed pump A trip due to servo malfunction
- October 17, 2010, Main feedwater isolation due to high steam generator level oscillations caused by feed regulating bypass valve control

The inspectors identified that four plant trips were related to the main feedwater system. Furthermore, all of the main feedwater events were maintenance related. The PN09 bus and servo failures were direct results of maintenance activities and the fuse failure was caused by a lack of preventive maintenance. However, the licensee evaluation did not attribute any of the failures to the feedwater system. Since the main feedwater system and function is a dominant contributor to the plant level monitoring function for reactor trips it should have also been placed in a(1) and appropriate corrective actions to restore to a(2) status established. This issue is captured in Condition Report 27144.

Analysis: The failure to establish performance monitoring goals commensurate with the mitigating safety function specified in the emergency operating procedures and the plant level criteria is a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it impacts equipment performance attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Using the NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding screened to a Phase 2 significance determination because it involved a potential loss of safety function of the main feedwater system and failure of the instrument air system. A Region IV senior reactor analyst performed a Phase 2 significance determination and using the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Wolf Creek," Revision 2.01a; however, the pre-solved worksheet did

not include the simultaneous failure of multiple components in different systems. Therefore, the senior reactor analyst performed a bounding Phase 3 significance determination using Appendix M of Inspection Manual Chapter 0609, "Significance Determination Process Using Qualitative Criteria," Section 4.1.2. The analyst determined that the finding was of very low safety significance (Green). The bounding change to the core damage frequency was approximately 8×10^{-7} /year. The dominant core damage sequences involved a loss of component cooling water, failure of operators to recover component cooling water, the failure of operators to start a charging pump and a reactor coolant pump seal loss of coolant accident. The relatively low risk worth of the instrument air system at Wolf Creek helped to mitigate the significance. To evaluate the change to the large early release frequency (LERF), the analyst used Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process." Wolf Creek has a large dry containment. The finding screened as having very low safety significance for LERF because it did not affect the intersystem loss of coolant accident or steam generator tube rupture categories. The inspectors determined that the finding had a crosscutting aspect in the area of problem identification and resolution. Specifically, when Wolf Creek evaluated exceeding the plant level monitoring criteria for reactor trips, their analysis did not identify that failures within the main feedwater system were the cause of four of the six reactor trips, and did not place the affected system function in a(1) monitoring [P.1(c)].

Enforcement: Title 10 CFR 50.65(a)(1) requires, in part, that each holder of an operating license for a nuclear power plant shall monitor the performance or condition of structures, systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that these structures, systems, and components, as defined in paragraph (b) of this section, are capable of fulfilling their intended functions. These goals shall be established commensurate with safety and, where practical, take into account industry-wide operating experience. The scope of paragraph (b) includes, in part, nonsafety-related structures, systems, and components that are used in emergency operating procedures. Title 10 CFR 50.65(a)(2) states in part, that monitoring as specified in paragraph (a)(1) is not required where it has been demonstrated that the performance or condition of a structure, system or component is being effectively controlled through the performance of preventive maintenance such that the structure, system or component remains capable of performing its intended function.

Contrary to the above, from January 1, 2008, to March 3, 2011, the licensee did not establish goals sufficient to provide reasonable assurance that structures, systems, and components, as defined in paragraph (b) of 10 CFR 50.65, were capable of fulfilling their intended functions. Specifically, (1) Wolf Creek did not establish appropriate goals to monitor the performance of the turbine-driven main feedwater system functions under operating conditions. This function was not fulfilled when failures in the main feedwater system caused reactor trips on April 28, 2009, March 2 and 8, and October 17, 2010. (2) Wolf Creek did not establish appropriate goals to monitor the performance of the turbine-driven main feedwater system standby restart function, as specified in emergency operating procedures. This function was not fulfilled when the pumps failed to restart during the recovery from the reactor trips of April 28 and August 19, 2009, and

the failures were not evaluated against any goals or criteria. (3) Wolf Creek did not establish appropriate goals to monitor the performance of the instrument air compressors' standby emergency restart function. Specifically, seven compressor demand failures occurred on November 18 and December 18, 2008; January 7, February 6, and May 14, 2009; March 10, 2010; and March 1, 2011. No monitoring goals were set and no evaluation of these failures was performed, leaving insufficient basis for the function to remain in 10 CFR 50.65(a)(2) status.

Because this violation is of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Report 36600, this violation is being treated as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-03, "Failure to Monitor the Performance of Nonsafety-Related Systems and Components Used in the Plant Emergency Operating Procedures under 10 CFR 50.65 Programs."

- .2 Introduction. The inspectors identified a Green noncited violation of 10 CFR 50.65 a(2), involving the failure to demonstrate that the performance of main control board annunciator power supplies was effectively controlled through preventive maintenance such that the annunciators remained capable of performing their intended function.

Description. The maintenance rule a(2) reliability criteria for function RK-01, "to provide the control room operator a visual and audible plant status condition," is less than two functional failures per 18 months. A functional failure is defined as an unplanned loss of more than six percent of the total annunciators. Performance of this function is monitored by tracking power supply failures since any power supply failure will result in a loss of more than six percent of the total annunciators. On October 13, 2009, 23 percent of main control board annunciators were lost due to independent failures of two power supplies, RK045E1PS2 and RK045E3PS1. Power supply E3PS1 fed 10.7 percent of the annunciators and power supply E1PS2 fed 12.1 percent of the annunciators. The two power supplies that failed are physically located in two separate plant annunciator system cabinets that are about six feet apart and are electrically separated with different 125Vdc power supply sources. Additionally, there are no common loads shared between the two power supplies.

The licensee classified the loss of the power supplies on October 13, 2009, as a single functional failure because greater than six percent of main control board annunciators had been lost and the power supplies had failed at nearly the same time. However, the licensee found no causal link between their failures. The inspectors concluded the licensee's evaluation lacked a technical basis to consider the failures as a single functional failure of the RK-01 function, and the failure of power supplies RK045E1PS2 and RK045E3PS1 represented two functional failures of the RK-01 function. As a result of the inadequate maintenance rule evaluation, the licensee did not recognize that the plant annunciator system exceeded its maintenance rule a(2) performance criteria. Because the power supply failures had not been correctly counted, goal setting, and monitoring were not performed as required by paragraph a(1) of the maintenance rule.

Analysis. The failure to properly evaluate the failed main control board annunciator power supplies, establish performance goals, and monitor their performance is

considered a performance deficiency. This finding is more than minor because it is associated with the Mitigating Systems Cornerstone attribute of equipment performance and it adversely affects the cornerstone objective ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding is determined to have very low safety significance since it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding was determined to have a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to properly classify, prioritize, and evaluate a condition adverse to quality [P.1(c)].

Enforcement. Title 10 CFR 50.65(a)(1) requires, in part, that the licensee monitor the performance or condition of structures, systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that such structures, systems, or components are capable of fulfilling their intended functions. Title 10 CFR 50.65 paragraph (a)(2) states, "Monitoring as specified in paragraph a(1) of this section is not required where it has been demonstrated that the performance or condition of a structure, system, or component is being effectively controlled through the performance of appropriate preventive maintenance, such that the structure, system, or component remains capable of performing its intended function." Contrary to the above, on December 10, 2009, Wolf Creek failed to demonstrate that performance of the main control board annunciator power supplies was being effectively controlled through the performance of appropriate preventive maintenance such that the system remained capable of performing its intended function and did not establish goals in a manner sufficient to provide reasonable assurance that the system was capable of fulfilling its intended functions. Specifically, the licensee did not identify that the main control board annunciator power supplies had exceeded their functional failure reliability criteria and did not establish performance monitoring goals for the system. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report 34681, this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-04, "Failure to Follow 10 CFR 50.65 a(2) for Main Control Board Annunciator Power Supply Failures."

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- January 8 to 13, 2011, Main generator exciter overvoltage

- February 14, 2011, Missed surveillance risk assessment– auxiliary feedwater and emergency core cooling systems swap over response time
- March 1, 2011, Refueling Outage 18 scheduled March 19 to May 7, 2011
- March 22, 2011, Low temperature overpressure protection control power emergent work
- March 28, 2011, Residual heat removal and spent fuel pool cooling risk assessment

The inspectors selected these activities based on potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues

- January 26, 2010, Essential service water snubbers posttransient walkdown
- March 3, 2010, Vital switchgear rooms temperature
- July 3 and 4, 2010, Residual heat removal snubbers posttransient walkdown
- February 10, 2011, Missing emergency diesel generator fuel oil tank coatings

- February 15, 2011, Emergency diesel generator jacket water Smith-Blair compression coupling failure
- February 25, 2011, Component cooling water B voiding
- March 7, 2011 , Refueling water storage tank boron concentration

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and USAR to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of seven operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04

b. Findings

- .1 Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, involving an inadequate calculation supporting vital switchgear room temperatures with only one vital switchgear cooler operable.

Description. Wolf Creek is designed with two vital switchgear air conditioning units. Each air conditioning unit cools one vital 4160V switchgear room, two sets of vital dc battery rooms, and two sets of vital dc switchgear. On August 3, 2010, Wolf Creek experienced a trip of the Train A vital switchgear air conditioning unit. Wolf Creek entered technical requirements manual (formerly USAR, Chapter 16) limiting condition of operation 3.7.23. Technical requirements manual 3.7.23 allows one vital air conditioning unit to be out of service for 7 days provided compensatory measures are taken. After 7 days, the technical specifications must be entered. Compensatory measures are stated in Procedure GK-200 and the inspectors found they were implemented in accordance with the procedure. The procedure opens all doors between the vital ac and dc switchgear rooms, places box fans between rooms, and posts continuous fire watches. The use of one air conditioning unit to cool all switchgear is based on configuration change package 07905. The inspectors reviewed the heat transfer calculations supporting change package 07905. The principle calculation is GK-06-W,

“SGK05A/B Class IE Electrical Equipment Rooms A/C Units, Single Unit Operation Capability.”

Calculation GK-06-W determined that the final rooms' temperature with one air conditioning unit would be 94°F and 100°F for normal operations and 94°F for all rooms during loss of coolant accident operation. However, USAR 3.11(B).2.3.2 states that the vital switchgear rooms will not exceed 90°F, and the Wolf Creek technical requirements manual specifies a maximum temperature limit of 87°F. Calculation GK-06-W assumption 14 acknowledges that the calculation results contradict the USAR and provides justification stating that 104°F is acceptable due to design of the equipment without providing specifics other than stating that battery capacity increases with temperature. The justification further states that 104°F may only be reached once or twice over plant life, and is therefore acceptable. No environmental qualification references are provided.

The inspectors reviewed Calculation GK-06-W and identified several discrepancies. Several heat loads were missing from the calculation, including normal operating loads such as pressurizer heater breakers that are always closed, diesel generator output breaker that is closed for testing, and one running centrifugal charging pump breaker that is closed for chemical and volume control duties. Loads missing during accident operations included nearly all 4160V breakers closed by the load sequencer. Additionally, Calculation GK-06-W assumed an 85°F room temperature for the health physics area under the 4160V switchgear room. This area is cooled by nonvital air conditioning units SGK02 and SGK03. These nonvital coolers are not protected under Procedure AP GK-200 or the maintenance rule risk assessment program. Using such a temperature effectively made the floor of rooms a plate-type heat exchanger which removed a significant amount of heat. The inspectors concluded the 85°F room temperature assumption was nonconservative since the nonvital coolers are not ensured to be running and are not protected equipment.

Also, the surface area of the ceiling of the 2016 foot elevation rooms used in the calculation was much less than the architectural drawings showed. The added surface area increased the heat transmitted to the dc switchgear rooms. The inspectors repeated the calculation with additional heat loads and found that room temperatures could be as high as 100°F for the lower ac switchgear rooms and 110°F for the upper dc switchgear rooms using the heat removal capacity stated in Calculation GK-06-W. The inspectors identified additional margin in performance tests of an SGK05 unit, and, in discussion with Wolf Creek engineering, estimated that the cooling coil was capable of removing an additional 22,000 Btu/hr based on instrumented performance testing of the cooling coil. The inspectors repeated the calculation with the cooling coil's additional capacity and found to be capable of cooling the rooms to about 97°F and 106°F, respectively. Given the acceptance criteria at 90°F per the USAR, the inspectors concluded that the calculation's inputs and justification of its results were inadequate. Wolf Creek initiated three Condition Reports 27276, 28252, and 31452 on this issue and will address the rooms' heat balance prior to the summer 2011.

Analysis. The inspectors considered the inadequate heat loads and assumptions used in calculation GK-06-W to be a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it impacted with the equipment performance attribute of the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors screened the finding to Green because the additional temperatures would not have caused the loss of functionality of vital switchgear or batteries, and it did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. No crosscutting aspects were identified because the supporting documentation was prepared in the late 1990s and was not representative of current licensee performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," required that Wolf Creek establish measures to assure that applicable regulatory requirements and design bases be correctly translated into specifications, and that design control measures be provided for verifying or checking the adequacy of design such as by the performance of design reviews, the use of alternate or simplified calculation methods, or the performance of a suitable testing program. Contrary to the above, on April 22, 1999, the measures established by the licensee failed to properly verify or check the adequacy of design through the use of calculation methods. Specifically, Wolf Creek approved Calculation GK-06-W which failed to adequately verify or check vital switch gear air conditioning unit design in that the heat balance calculation did not ensure that the cooling coil could remove sufficient heat from both trains of switchgear to maintain temperature in accordance with the USAR. Because this issue was determined to be of very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Reports 27276, 28252, and 31452, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-05, "Inadequate Calculation for Vital Switchgear Cooling."

- .2 Introduction. The inspectors identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion V, involving the failure to follow plant procedures. Specifically, the licensee failed to follow procedure and perform an operability determination when a nonconforming or degraded condition was identified in the Train B emergency diesel generator fuel oil storage tank, as required by Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21.

Description. On April 10 to 14, 2002, Wolf Creek personnel performed surveillance requirement STN MT-002, "Standby Diesel Fuel Oil Storage Tanks Drain and Clean," Revision 1, on diesel fuel oil storage tank TJE01B. During the cleaning of the storage tank, the licensee discovered approximately 40 percent of the protective interior coating was damaged or missing from the inside tank wall. Regulatory Guide 1.137, as endorsed by the licensee's USAR, requires this coating to protect against corrosion of the tank.

On April 13, 2002, shortly after discovery of the degraded coating, Wolf Creek personnel prepared and issued engineering disposition CCP 10153, "Missing Coating on TJE01B,"

Revision 1. The conclusion of CCP 10153, Revision 0, was to replace the coating during the next outage. This engineering disposition was subsequently revised to allow use of the tank with the coating missing.

During the week of January 19, 2011, a Wolf Creek engineering standards team performed a self-assessment and review of engineering disposition CCP 10153. The licensee determined that the conclusions of CCP 10153, use the fuel oil storage tank with a missing interior coating was inadequate and generated Condition Report 32348 documenting the degraded condition in the Train B fuel oil storage tank.

Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21, requires that plant personnel perform an immediate operability determination when a nonconforming or degraded condition is identified. Specifically, Section 4.6 states, "An immediate determination of technical specification structures, systems, or components operability is completed after confirming that a degraded or nonconforming condition exists that could impact the capability of structures, systems, or components to perform their specified safety function(s). The immediate operability determination is made without delay and in a controlled manner using the best available information."

On February 9, 2011, the inspectors questioned the current operability of the Train B fuel oil storage tank given the determination by the engineering review team that the missing coating was a degraded or nonconforming condition. However, the licensee had not performed an operability determination immediately after identifying this degraded or nonconforming condition, as required by procedure. The licensee subsequently performed an operability determination and determined the fuel oil storage tank to be operable, but degraded.

Analysis. The failure to follow Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21, when a nonconforming or degraded condition was identified was a performance deficiency. This performance deficiency was more than minor because it could become a more significant safety concern if left uncorrected. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding had very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee failed to thoroughly evaluate problems, including evaluating for operability, such that the resolution addressed the cause [P.1(c)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to this requirement, on January 14, 2011, the

licensee failed to accomplish an activity affecting quality in accordance with prescribed procedures. Specifically, the licensee failed to follow procedure and perform an immediate operability determination after identifying a degraded or nonconforming condition, as required by Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21. The licensee subsequently performed an operability determination on February 9, 2011, and determined the fuel oil storage tank to be operable, but degraded. Because this violation was of very low safety significance and was entered into the licensee's corrective action program as Condition Reports 33355 and 34068, this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000485/2011002-06, "Failure to Perform an Operability Determination for Degradation of the Fuel Oil Storage Tank."

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- October 6, 2004, and August 20, 2010, Ultimate heat sink dredging
- January 7, 2011, Auxiliary feedwater pump A full flow test after discharge check valve replacement.
- January 24, 2011, Diesel generator A jacket water temperature low after start
- February 23, 2011, Ultrasonic testing of component cooling water Train B after fill and vent
- March 1, 2011, Service water to essential service water valve diagnostic testing after packing and electrical maintenance
- March 10, 2011, Diesel fire pump run after jacket water hose replacement

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the USAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

- .1 Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50 Appendix B, Criterion III, involving a failure to perform periodic testing to verify that ultimate heat sink sedimentation remained within design basis limits.

Description. In April 1982, the NRC issued NUREG-0881, "Safety Evaluation Report Related to the Operation of Wolf Creek Generating Station, Unit 1." In Section 2.4.4.4, "Sedimentation in the Ultimate Heat Sink," the NRC approved annual visual inspections as a means of ensuring that design basis sedimentation limits, and by extension the safety-related function of the ultimate heat sink, were maintained and verified throughout the period of licensed plant operation. The NRC staff considered the annual visual inspection surveillance to be part of Wolf Creek's licensing bases for meeting the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 44, "Cooling Water." The ultimate heat sink safety design basis is described in USAR Sections 9.2.5.1.1 and includes:

- Safety Design Basis One - The ultimate heat sink provides a reliable source of cooling water to dissipate the heat of an accident safely and to achieve and maintain safe shutdown of one nominal 1,214 MWe unit following a design bases accident.
- Safety Design Basis Two - The ultimate heat sink supplies emergency makeup water to the fuel storage pool and component cooling water systems, and is the backup water supply for the auxiliary feedwater system.
- Safety Design Basis Five - The ultimate heat sink was designed to withstand postulated site-related events, such as loss of the main cooling lake.

The system functions are met using acceptance criteria for temperature, water level, and sedimentation level. USAR Section 9.2.5.3.1 states: "Dredging of the ultimate heat sink will be performed whenever necessary to maintain a minimum capacity and adequate flow to the essential service water pumps," and Section 9.2.5.4 states: "The ultimate heat sink is inspected periodically to determine degree of siltation." NUREG-0881 stated

NRC approval was based, in part, on annual measurements to ensure that sedimentation levels remained within predefined limits to keep the ultimate heat sink capable of performing its safety-related functions. This ensured the required volume of water in the ultimate heat sink to meet the input assumption design requirement.

The licensee took annual sediment measurements as required between January 1985, and September 2002. On August 8, 2003, Wolf Creek developed USAR change 04-027, which was implemented as Revision 18 to the USAR on March 11, 2005. This revision removed the annual sediment depth surveillance of the ultimate heat and replaced it with a periodic dredging preventive maintenance activity to be performed every five years.

The inspectors reviewed the justification for replacing the annual visual surveillance with the five-year dredging activity. The inspectors concluded the basis for periodicity of dredging was nonconservative since it relied upon an average sedimentation rate over a 17-year period rather than a maximum sedimentation rate. The inspectors also reviewed the dredging work orders and data and determined that the dredging activity did not verify as-found or as-left ultimate heat sink depth to assure conformance to the ultimate heat sink design. The 5-year frequency was also not carried out between 2004 and 2010, but was extended under an administrative 25 percent grace period. The inspectors concluded that the 5-year preventive maintenance activity was not adequate to ensure that a sufficient volume of water would be maintained in the ultimate heat sink to meet the design basis requirements. The licensee subsequently measured the ultimate heat sink depth with SONAR on August 13 and 14, 2010, and determined that the actual sediment depth supported ultimate heat sink operability and conformance with the USAR design basis requirements.

Analysis. The failure to perform periodic testing to verify that ultimate heat sink sedimentation remained within design basis limits is a performance deficiency. The issue is more than minor, and therefore a finding, because if left uncorrected the issue has the potential to become a more significant safety concern. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding had very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors concluded that this finding's cause has a crosscutting aspect in the area of human performance associated with the work control component because Wolf Creek did not appropriately coordinate work activities by incorporating actions to address the impact of changes to the work scope or activity on the plant and human performance. Specifically, when Wolf Creek performed and planned dredging preventive maintenance on the ultimate heat sink, they did not consider the need to confirm as-found and as-left sedimentation data, to verify that their design basis was met [H.3(b)].

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states in part that, measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the

use of alternate or simplified calculation methods, or by the performance of a suitable testing program. Contrary to the above, from March 11, 2005, until August 27, 2010, the measures established by the licensee failed to assure that applicable regulatory requirements and the design basis of the ultimate heat sink were correctly translated into specifications, drawings, procedures, and instructions through the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program. Specifically, Wolf Creek discontinued periodic verification of sedimentation levels in the ultimate heat sink without verification that the heat sink design would continue to be met for the effects of sediment accumulation. Because this finding is of very low safety significance and was entered into the corrective action program as Condition Report 27144, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-07, "Failure to Verify Ultimate Heat Sink Sedimentation Levels within Design Bases."

- .2 Introduction. The inspectors reviewed a Green self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to perform an adequate fill and vent of the component cooling water system which resulted in voiding of the system.

Description. On February 16, 2011, the licensee isolated and drained pump D of component cooling water Train B for planned maintenance. The licensee intended to maintain Train B operable with pump B available. After maintenance, the licensee filled and vented the isolated portion of Train B. On February 23, 2011, the licensee started pump D for postmaintenance testing. When pump D started, pump B automatically started due to sensed low discharge pressure of pump D. In addition, the Train B component cooling water surge tank inventory reduced approximately 23 cubic feet. The licensee recognized these indications as symptoms of voiding in the system and declared Train B inoperable. After extensive flushing and ultrasonic inspections for voiding, Train B was declared operable on February 25, 2011.

During filling and venting of pump D on February 22, 2011, licensee personnel opened the suction isolation valve while venting from the pump casing. Since the suction isolation valve is physically higher than the pump casing, air in the suction piping rose into the common suction line of pumps B and D of Train B instead of being vented through the pump casing. Clearance order D-EF-B-010A restoration instructions required ultrasonic testing of the discharge piping, but did not direct testing on the pump suction piping. The inspectors concluded that after introducing air into the system during maintenance, the licensee performed an inadequate fill and vent by failing to vent from the high point of the system. The inspectors also concluded the clearance order restoration instructions were inadequate in that they failed to require ultrasonic testing of the high point of the system. The inspectors determined the introduction of air to the suction side of both component cooling water Train B pumps reduced the reliability of the system; however, the system continued to be able to perform its safety function.

The inspectors determined the cause of the inadequate clearance restoration order was a mistaken belief that any air on the suction side of the pumps would self-vent back to the surge tank. This misconception was one of the root causes for previous component

cooling water voiding events documented in NRC Inspection Report 05000482/2010008. Therefore, the inspectors concluded that corrective actions from previous component cooling water voiding events had not been fully effective.

Analysis. The inspectors determined that the failure to perform an adequate fill and vent of component cooling water that resulted in system voiding was a performance deficiency. The inspectors determined that this finding was more than minor because it is associated with the human performance attribute of the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to take appropriate corrective actions from previous voiding events [P.1(d)].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires that written procedures be established and implemented covering activities specified in Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," February 1978. Regulatory Guide 1.33, Appendix A, Section 9, requires, in part, that maintenance that can affect the performance of safety-related equipment be performed in accordance with written instructions appropriate to the circumstances. Contrary to the above, on February 22, 2011, the license failed to perform maintenance that affected the performance of safety-related equipment with written instructions appropriate to the circumstances. Specifically, clearance order D-EF-B-010A restoration instructions were not appropriate to the circumstances in that the instructions resulted in inadequate filling and venting resulting in gas introduction to the system. Because of the very low safety significance of this finding and because the licensee entered this issue into the corrective action program as Condition Report 33925, this violation is being treated as a noncited violation in accordance with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000482/2011002-08, "Inadequate Fill and Vent of Component Cooling Water."

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the refueling outage, starting on March 19, 2011, to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense in depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Configuration management, including maintenance of defense in depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service.
- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities.
- Monitoring of decay heat removal processes, systems, and components.
- Verification that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system.
- Reactor water inventory controls, including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Controls over activities that could affect reactivity.
- Licensee identification and resolution of problems related to refueling outage activities.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one refueling outage and other outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

Introduction. The inspectors reviewed a self-revealing Green noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow the requirements of Procedure AP 21E-001, "Clearance Orders." This procedure violation resulted in an inadequate tagout for the Train A solid state protection system resulting in an unplanned swap of the volume control tank charging pump suction to the reactor water storage tank and an unplanned entry into Technical Specification 3.4.12 due to the de-energization of power operated relief valve A low temperature overpressure protection relays.

Description. On March 22, 2011, control room operators received an annunciator alarm indicating realignment of the charging pump suction from the volume control tank to the reactor water storage tank. The volume control tank level increased from 95 to 100 percent and tank pressure increased from 18 to 40 psi. Control room operators re-aligned the volume control tank suction back to the charging flow path, and the volume control tank level and pressure returned to their normal operating levels.

The licensee subsequently determined that a clearance order had de-energized the Train A solid state protection system, de-energizing both the Train A reactor water storage tank swap over and power operated relief valve low temperature overpressure protection relays. The Train A reactor water storage tank swap over required manual operator action to address the increase in volume control tank level and the de-energization of the power operated relief valve low temperature overpressure protection relay placed the plant in Technical Specification 3.4.12, Condition F, which has a requirement to restore the power operated relief valve to operable status within 24 hours. The low temperature overpressure protection system controls reactor coolant system pressure at low temperatures so the integrity of the reactor coolant pressure boundary is not compromised. Upon recognizing that the inadequate clearance order was the cause of the reactor water storage tank swap over and de-energization of the power operated relief valve, operators removed the clearance order and restored all equipment to its normal operating condition approximately 4 hours after receiving the initial control room alarm.

Clearance order R-SB-A-004 was generated in preparation for a vendor to perform logic testing of the Train A solid state protection system circuit boards consistent with industry operating experience. The clearance order worksheet contained very limited details describing the vendor's work scope. The clearance order instructions, provided only a few days prior to the scheduled start date, simply requested to de-energize the Train A solid state protection system cabinet. No licensee personnel were completely cognizant of the vendor's planned scope of work. The licensee recognized that there are numerous power sources supplying the solid state protection system cabinets, and decided to expand the clearance order scope to include the instrument ac power, 125Vdc power, and reactor protection breakers that supply the Train A solid state protection system cabinet. The reactor water storage tank swap over and de-energization of the power operated relief valve was caused by a failure to recognize that opening instrument ac power breaker NN00112 would de-energize the Train A solid state protection system slave relay power supply.

Analysis. The failure to follow procedures to complete clearance orders with adequate boundaries is a performance deficiency. The performance deficiency was more than minor because it impacted the Initiating Events Cornerstone objective of configuration control to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The significance of the finding was determined using Inspection Manual Chapter 0609, Significance Determination Process, Appendix G, Checklist 2, and determined to be of very low safety significance, because it did not cause the loss of mitigating capability of core heat removal, inventory control, power availability, containment control, or reactivity control. Additionally, the cause of the finding is related to the human performance crosscutting component of work control. Specifically, the licensee did not appropriately plan for the maintenance work scope by ensuring work groups and an offsite organization communicate the necessary electrical boundaries to assure plant and human performance [H.3(b)].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires, in part, that written procedures shall be established, implemented and maintained for the activities

recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, Appendix A, February 1978. Section 1.c of Regulatory Guide 1.33, Revision 2, Appendix A, recommends procedures for equipment control (e.g., locking and tagging). Wolf Creek Procedure AP 21E-001, "Clearance Orders," Revision 27, step 5.7.1, requires the licensee to develop clearance order instructions, based on the work scope, so adequate tagging boundaries can be developed. Contrary to this requirement, on March 19, 2011, the licensee failed to provide clearance order instructions, based on the work scope, so adequate tagging boundaries could be developed in the tagout boundary for clearance order R-SB-A-004. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report 35318, this violation is being treated as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-09, "Inadequate Clearance Order Disables Power Operated Relief Valve Low temperature Overpressure Protection Train."

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the USAR, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements

- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- December 6, 2010, 25 year containment tendon surveillance
- December 16, 2010, Turbine-Driven auxiliary feedwater pump inservice test
- January 10, 2011, Incore-Excore axial flux difference comparison
- January 10, 2011, Heat flux hot channel factor
- January 24, 2011, KJ-005A Jacket water temperature control valve
- February 15, 2011, Over-Temperature Delta-Temperature and Over-Power Delta-Temperature trip setpoint
- February 18, 2011, Diesel generator fuel oil storage tank cloud point
- February 28, 2011, Safety injection pump A inservice test
- March 7, 2011, Turbine-Driven auxiliary feedwater check valve inservice test

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of nine surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow Procedure AP 21-001, "Conduct of Operations." Specifically, the licensee failed to enter into technical specification limiting condition of operation 3.7.5.B.1 for one auxiliary feedwater pump inoperable during performance of 92-day check valve surveillance tests.

Description. On March 7, 2011, the inspectors identified that technical specification 3.7.5 limiting condition of operation action statement B.1 was not logged

during turbine-driven auxiliary feedwater check valve testing. The check valve testing involved opening one-inch drain lines on the upstream and downstream sides of the suction check valves. A torque wrench is then applied to the valve disc pin, and the valve is checked for the correct opening torque. During this time, the open drain lines create the potential to divert suction flow from the pump. This condition affected suction check valves from the condensate storage tank or the essential service water pumps. The inspectors concluded this condition impacted the operability of the auxiliary feedwater pumps since the open drain lines could result in water spray in the room, additional flooding volume, a decrease in pump net positive suction head, lost condensate storage tank inventory and lost ultimate heat sink inventory.

Wolf Creek initiated Condition Report 34469 to evaluate the condition. Wolf Creek concluded that the auxiliary feedwater pumps were inoperable during each of their respective check valve testing procedures. Wolf Creek changed all the auxiliary feedwater check valve testing procedures to add steps to declare the pump inoperable or take appropriate manual actions to ensure operability. The added steps provide the option of entering the action statement or posting a nonlicensed operator with continuous communications to the control room to shut the vent valves, if needed. The inspectors determined that Wolf Creek had failed to recognize that Technical Specification 3.7.5.B.1 applied and did not log entry into the action statement for Procedure STS AL-210C (turbine-driven pump) on March 12, June 10, July 29, and December 10, 2010, and March 6, 2011; for Procedure STS AL-210A (Train A pump) on June 1, August 31, November 27, 2010, and March 4, 2011; and Procedure STS AL-210B (Train B pump) on June 16, August 17, September 16, and December 15, 2010.

Procedure AP 21-001, "Conduct of Operations," required the licensee to review each evolution for technical specification applicability per step 6.8.4. The inspectors interviewed licensee personnel on procedures that do not direct entry into technical specification action statements and determined the licensee relied on informally maintained pre-job briefing sheets to meet this requirement. The inspectors reviewed the pre-job briefing sheets for the suction check valve testing and concluded that the sheets contained good guidance on error traps, expected equipment responses, internal operating experience and acceptance criteria, but did not contain instructions on manual actions to maintain operability or instructions to enter technical specification action statements sufficient to address technical specification applicability.

Analysis. The failure to enter technical specification action statements in accordance with Procedure AP 21-001 was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it impacted with the human performance attribute of the Mitigating Systems Cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the issue did not result in a loss of operability for a time period greater than the action statement, and did it not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the finding has a crosscutting aspect in the area of human performance associated with decision making. Specifically, informally

maintained pre-job briefing sheets were being relied upon to determine technical specification applicability instead of the licensee's decision making process of operator review on a case by case basis [H.1.a.].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires that written procedures be established, implemented, and maintained covering activities related to procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, 1978. Regulatory Guide 1.33, Section 1(h), "Administrative Procedures," requires log entries. Procedure AP 21-001, "Conduct of Operations," Revision 50, step 6.8.4, requires, in part, plant log entries of technical specification action statements and that operations shall review technical specification requirements for each evolution. Contrary to the above, on March 7 and 12, June 1, 10, and 16, July 29, August 17 and 31, September 16, November 27, and December 10 and 15, 2010, and March 4, 2011, Wolf Creek failed to review technical specification requirements and log technical specification action statement 3.7.5.B.1 when any of the three auxiliary feedwater pumps were out of service for check valve testing which rendered the pumps inoperable. Because this issue was determined to be of very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Report 34469, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-10, "Repetitive Failure to Enter Technical Specifications for Auxiliary Feedwater Suction Valve Testing."

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspector performed an in-office review of the Wolf Creek Emergency Plan; Document APF 06-002-01, "Emergency Action Levels," Revision 15. This revision changed the bases 1-RER5 of EAL-1, "Radioactive Effluent Release," for Radiation Monitor 0-SD-RE-41 from 23,500 millirem per hour (the times 1000 value) to 10,000 millirem per hour (the upper detection limit of the monitor). Also, Procedure OFN RP-014, "Hot Standby to Cold Shutdown from Outside the Control Room," was deleted from bases 9-LPC/SC5 of EAL-9, "Loss of Plant Control/Security Compromise," since this procedure can only be entered through other procedures already listed.

This revision was compared to its previous revision, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the standards in 10 CFR 50 47(b) to determine if the revision adequately implemented the requirements of 10 CFR 50.54(q). This review was not documented in the SER and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on January 11, 2011, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the turbine failure and resulting Alert to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational and Public Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

This area was inspected to: (1) review and assess licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities and the implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures, (2) verify the licensee is properly identifying and reporting Occupational Radiation Safety Cornerstone performance indicators, and (3) identify those performance deficiencies that were reportable as a performance indicator and which may have represented a substantial potential for overexposure of the worker.

The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors performed walkdowns of various portions of the plant, performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation reported by the licensee in the Occupational Radiation Safety Cornerstone
- The hazard assessment program, including a review of the licensee's evaluations of changes in plant operations and radiological surveys to detect dose rates, airborne radioactivity, and surface contamination levels
- Instructions and notices to workers, including labeling or marking containers of radioactive material, radiation work permits, actions for electronic dosimeter alarms, and changes to radiological conditions
- Programs and processes for control of sealed sources and release of potentially contaminated material from the radiologically controlled area, including survey performance, instrument sensitivity, release criteria, procedural guidance, and sealed source accountability
- Radiological hazards control and work coverage, including the adequacy of surveys, radiation protection job coverage, and contamination controls; the use of electronic dosimeters in high noise areas; dosimetry placement; airborne radioactivity monitoring; controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools; and posting and physical controls for high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements
- Audits, self-assessments, and corrective action documents related to radiological hazard assessment and exposure controls since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one required sample as defined in Inspection Procedure 71124.01-05.

b. Findings

Introduction. Inspectors identified a Green noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow procedure requirements for increased work scope on an existing radiation work permit.

Specifically, welding was performed in a locked high radiation area on a radiation work permit that did not cover that type of activity.

Description. On January 4, 2011, work was performed under maintenance work order 11-336634-000 in a locked high radiation area on the 1988' elevation of the auxiliary building. The radiological aspects of the work were covered using radiation work permit 110039. The radiation work permit stated that this permit was not intended to be used for major contamination breaches. During the work, welders cut into and welded a contaminated pipe. This type of activity was not covered by the radiation work permit.

Wolf Creek Procedure RPP 02-105, "RWP," states that if the exposure estimate to complete the work is greater than 100 mrem it is appropriate to consider creating a new radiation work permit. As described in the licensee identified violation in Section 4OA7 of this report, the licensee performed an inadequate hazard assessment of the work by performing a dose estimate for the job using the incorrect location and by underestimating the number of workers who would be required for the work. Due to the inadequate hazard assessment, the dose estimate did not reach the 100 mrem threshold. This caused a missed opportunity to recognize the potential benefits of creating a separate radiation work permit or revising radiation work permit 110039 for this work activity.

Instead, the licensee removed a special instruction specifying that grinding and welding activities were not allowed on radiation work permit 110039. In addition, health physics staff changed the alarm settings on the workers' electronic dosimeters to support the new work scope. This change was contrary to Procedure RPP 02-105 which states that health physics may assign work to an existing radiation work permit when it:

- Appropriately covers the type of work
- Has proper stop points
- Meets the radiation work permit risk assessment
- Meets the respiratory protection evaluation
- Meets the additional dosimetry worksheet
- Will not change the exposure goal or estimate.

The licensee did not evaluate that the above conditions were met before using radiation work permit 110039 for the increased work scope. The change in work scope resulted in the exposure estimate being increased from 90 mrem to 300 mrem. The licensee placed the finding into the corrective action program as Condition Report 00035522 and acknowledged that the radiation work permit used was inappropriate for the work completed.

Analysis. The failure to follow a procedure was a performance deficiency. The finding was more than minor because it negatively impacted the Occupational Radiation Safety Cornerstone's attribute of program and process, in that the use of an inadequate radiation work permit led to workers' unplanned, unintended dose. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance

because: (1) it was not associated with as low as is reasonably achievable (ALARA) planning or work controls, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. In addition, this finding has a crosscutting aspect in the area of Human Performance related to work controls. Specifically, there was inappropriate coordination and communication of work activities between work groups [H.3.b].

Enforcement. Technical Specification 5.4.1.a requires that procedures be established, implemented and maintained as recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, February 1978, Appendix A. Section 7.e of Appendix A covers exposure controls, including a radiation work permit system. Wolf Creek Procedure RPP 02-105 "RWP," Section 9.2, "Assigning work to an existing radiation work permit number," states in part, that "Health Physics may assign work to an existing radiation work permit number when: the radiation work permit appropriately covers this type of work and the work will not change the current radiation work permit exposure goal or estimate." Contrary to the above, on January 4, 2011, Wolf Creek inappropriately allowed maintenance work to be performed under radiation work permit 110039 that did not appropriately cover the type of work and significantly changed the exposure estimate. Specifically, the maintenance work order included cutting into a contaminated system, which contradicted the radiation work permit statement that it was not meant for major contamination breaches. Also, the added work did change the radiation work permit exposure goal, in that it increased the exposure estimate to 300 mrem from the original estimate of 90 mrem. Since this violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report 35522, it is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011002-11, "Failure to Follow Radiation Work Permit Instructions."

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

This area was inspected to assess performance with respect to maintaining occupational individual and collective radiation exposures ALARA. The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel and reviewed the following items:

- Site-specific ALARA procedures and collective exposure history, including the current 3-year rolling average, site-specific trends in collective exposures, and source-term measurements
- ALARA work activity evaluations/postjob reviews, exposure estimates, and exposure mitigation requirements

- The methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one required sample as defined in Inspection Procedure 71124.02-05.

b. Findings

No findings were identified.

2RS03 In-plant Airborne Radioactivity Control and Mitigation (71124.03)

a. Inspection Scope

This area was inspected to verify in-plant airborne concentrations are being controlled consistent with ALARA principles and the use of respiratory protection devices onsite does not pose an undue risk to the wearer. The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel, performed walkdowns of various portions of the plant, and reviewed the following items:

- The licensee's use, when applicable, of ventilation systems as part of its engineering controls
- The licensee's respiratory protection program for use, storage, maintenance, and quality assurance of NIOSH certified equipment, qualification and training of personnel, and user performance
- The licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions, status of SCBA staged and ready for use in the plant and associated surveillance records, and personnel qualification and training

- Audits, self-assessments, and corrective action documents related to in-plant airborne radioactivity control and mitigation since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71124.03-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

40A1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the 4th Quarter 2010 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams per 7000 critical hours performance indicator for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports for the period of January 1, 2010, through December 31, 2010, to validate the accuracy of the submittals. The

inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one unplanned scrams per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams with complications performance indicator for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports for the period of January 1, 2010, through December 31, 2010, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one unplanned scrams with complications sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Unplanned Power Changes per 7000 Critical Hours (IE03)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned power changes per 7000 critical hours performance indicator for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports, and NRC integrated inspection reports for the period of January 1, 2010, through December 31, 2010, to validate the accuracy

of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one unplanned transients per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.5 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors reviewed performance indicator data for the fourth quarter 2010 through the first quarter 2011. The objective of the inspection was to determine the accuracy and completeness of the performance indicator data reported during these periods. The inspectors used the definitions and clarifying notes contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, as criteria for determining whether the licensee was in compliance.

The inspectors reviewed corrective action program records associated with high radiation area and very high radiation area nonconformances. The inspectors reviewed radiological controlled area exit transactions greater than 100 mrem. The inspectors also conducted walkdowns of high radiation areas and very high radiation area entrances to determine the adequacy of the controls of these areas.

These activities constitute completion of the occupational exposure control effectiveness sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.6 Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual
Radiological Effluent Occurrences (PR01)

a. Inspection Scope

The inspectors reviewed performance indicator data for the fourth quarter 2010 through the first quarter 2011. The objective of the inspection was to determine the accuracy and completeness of the performance indicator data reported during these periods. The inspectors used the definitions and clarifying notes contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, as criteria for determining whether the licensee was in compliance.

The inspectors reviewed the licensee's corrective action program records and selected individual annual or special reports to identify potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose.

These activities constitute completion of the radiological effluent technical specifications/offsite dose calculation manual radiological effluent occurrences sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

40A2 Identification and Resolution of Problems (71152)

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors selected a corrective action item documenting the missed risk assessment of the extended motor-driven main feedwater pump maintenance from November 5 to 18, 2010, for detailed followup.

These activities constitute completion of one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings and Observations

No findings were identified. The licensee's evaluation identified that Wolf Creek failed to follow its procedure for turnover of maintenance that takes longer than scheduled. The inspectors observed that the evaluation missed an opportunity to re-assess the risk significance of the three main feedwater pumps to be consistent with the scrams and scrams with complications root cause evaluations, which identified that Wolf Creek was not maintaining the main feedwater system, in part, because the system was incorrectly regarded as a low risk significance system. Elevating the risk significance would aid Wolf Creek in assessing the risk associated with working on more than one main feedwater pump at the same time. Wolf Creek initiated Condition Report 30245 to evaluate this observation.

40A3 Event Follow-up (71153)

- .1 (Closed) LER 2009-007-00, Removal of Equipment from Service Required by Technical Specifications and NRC Safety Evaluation - RETRACTED

This event was reviewed by Region IV and Headquarters staff and determined not to be reportable. Reference enforcement action EA-09-326 under ADAMS accession number ML100630900 for further information. This licensee event report (LER) is closed.

.2 (Closed) LER 2009-008-00, Potential of Containment Coolers to Have not Automatically Started in Slow Speed - RETRACTED.

The licensee received operating experience that indicated that thermal overloads for containment fan coolers were set too low for fan operation in a postaccident environment. There was insufficient evidence to show that the containment coolers could accomplish their safety function, so the licensee reported the condition on January 11, 2010. Subsequent to the report, the licensee evaluated the thermal overload settings and determined that the settings were adequate. Therefore, the licensee retracted the report on March 30, 2010. The inspectors reviewed the basis for the retraction. No violations were identified during the inspectors' review. This LER is closed.

.3 (Closed) LER 2009-009-00; -01, Defeating Feedwater Isolation on Low Tavq Coincident with P-4 Function Results in Missed Mode Change

On October 22, 2009, the inspectors identified a failure to report a condition prohibited by technical specification for defeating both trains of the P-4 interlock. LER 2009-009-00 reported this condition per 50.73(a)(2)(i)(B), but the licensee did not report the event under reporting criteria 50.73(a)(2)(v) as a safety system functional failure. The NRC documented this failure as a Severity Level IV noncited violation, NCV 05000482/2009005-15, "Failure to Report a Condition that Could Have Prevented Fulfillment of a Safety Function." Subsequently, Wolf Creek submitted LER 2009-009-01 which correctly reported the issue under 50.73(a)(2)(v). No additional violations were identified during the inspectors' review. These LERs are closed.

.4 (Closed) LER 2009-010-00; -01, Failure to Meet Limiting Condition for Operation 3.0.4b During Transition from Mode 4 to Mode 3

On November 17, 2009, heat up activities were in progress to return the plant to service following a refueling outage with the plant ready to transition from Mode 4 to Mode 3 with the exception of completing some work activities and postmaintenance testing to restore the turbine-driven auxiliary feedwater pump to a functional status. A risk assessment was completed as required by limiting condition for operation 3.0.4b and required that protected train signs be posted on the motor driven auxiliary feedwater pump rooms. On November 18, 2009, at 12:24 a.m., the plant transitioned from Mode 4 to Mode 3 under the provisions of limiting condition for operation 3.0.4b for the turbine-driven auxiliary feedwater pump with no protected equipment signs posted for the motor-driven auxiliary feedwater pump rooms. The inspectors identified the condition later that morning and upon notification of the control room operators, the protected train signs were hung at 10:00 a.m., satisfying all actions required by limiting condition for operation 3.0.4b.

The inspectors reviewed apparent cause evaluation 22483, the hazard-barrier-target analysis, and new and revised station procedures associated with this event. The

inspectors concluded that Wolf Creek's corrective actions were adequate to ensure compliance during future mode changes made under Technical Specification 3.0.4b. A violation associated with this event is described in NRC Inspection Report 05000482/2009005 as NCV 05000482/2009005-05, "Mode Change under Technical Specification 3.0.4.b Without Required Risk Management Actions." The inspectors concluded that Wolf Creek satisfied the applicable Regulatory Commitment associated with this LER documented in a letter from Mr. S. Hedges to the NRC dated July 13, 2010. These LERs are closed.

.5 (Closed) LER 2010-001-00, Automatic Start of Motor-Driven Auxiliary Feedwater Pumps Inoperable During Startup in Mode 1

On February 4, 2010, licensee personnel reviewed industry operating experience and identified that the anticipatory actuation of the auxiliary feedwater pumps on a trip of both main feedwater pumps would not function under certain conditions. Specifically, the logic would not actuate on trip of a single operating main feedwater pump if the second main feedwater pump was secured and reset. Two channels of auxiliary feedwater actuation logic are required to be operable in Modes 1 and 2 as specified by Technical Specification Table 3.3.2-1, function 6.g. There is no specified required action for two inoperable channels, so limiting condition for operation 3.0.3 would be applicable requiring action to be initiated within 1 hour to place the unit in Mode 3 in 7 hours. A review by the licensee discovered occurrences where the required channels were both inoperable and the technical specification required action was not completed. The licensee determined that the occurrences constituted a condition prohibited by technical specifications, a common-cause inoperability of independent channels and a safety-system functional failure. The inspectors reviewed the licensee's submittal and determined that the report adequately documented the summary of the event, the potential safety consequences, and the corrective actions required to address the performance deficiency. The enforcement aspects of this violation were discussed in NRC inspection report 05000482/2010002 in noncited violation NCV 05000482/2010002-05, "Failure to Follow Procedure for a Main Feed Pump Trip." No additional violations were identified during the inspectors' review. This LER is closed.

.6 (Closed) LER 2010-002-00, Turbine Trip Function of Reactor Trip, P-4 Interlock Defeated During Entry Into and in Mode 3

As part of the extent of condition review for NCV 05000482/2009005-15, "Failure to Report a Condition that Could Have Prevented Fulfillment of a Safety Function," Wolf Creek identified that the P-4 interlock for turbine trip was being defeated in Mode 3. The issue was reported as a condition prohibited by technical specification for defeating both trains of the P-4 interlock. This included the reporting criteria under 50.73(a)(2)(i)(B) and 50.73(a)(2)(v). A licensee identified violation involving this issue is included in Section 4OA7 of this report. No additional violations were identified during the inspectors' review. This LER is closed.

.7 (Closed) LER 2010-014-00, Technical Specification Required Shutdown Due to Inadequate Planning Resulting in Extended Emergency Diesel Generator Inoperability

On November 29, 2010, the licensee removed Train A emergency diesel generator from service for a scheduled 7-day technical specification equipment outage in accordance with Technical Specification 3.8.1, Condition B. During the outage, a number of delays occurred and a high number of emergent work activities impacted the schedule. On December 6, 2010, during the final surveillance run for declaring the emergency diesel generator operable, the licensee identified that the peak firing pressure for cylinder 12 was almost 500 psig less than expected. The licensee determined that the condition could not be fixed within the remaining time in the technical specification equipment outage and commenced a shutdown of the reactor in compliance with technical specifications.

The license determined that the retaining bolt for the fuel injector pump timing adjustment lock plate on cylinder 12 had backed out due to a loose/deformed keeper plate. This affected the timing of the injector pump and caused the reduction in the cylinder pressure. The remaining cylinders were inspected and no other problems were found. Work on the emergency diesel generator Train A was completed and the emergency diesel generator was returned to operable status on December 7, 2010, and Wolf Creek returned to Mode 1 on December 8, 2010.

The inspectors reviewed the root cause analysis and associated actions taken for this event documented in Condition Report 30918. Wolf Creek determined that the root cause of the unplanned shutdown was weaknesses in coordination of emergent work into the work scheduling and work control processes. The inspectors concluded that no violations of NRC requirements occurred during this event and that the cause evaluation and corrective actions were appropriate. This LER is closed.

40A6 Meetings

Exit Meeting Summary

On March 15, 2011, the inspectors discussed the results of the in-office inspection of changes to the licensee's emergency plan with Mr. T. East, superintendent emergency planning, and other members of the licensee's staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On March 25, 2011, the inspectors presented the results of the radiation safety inspection to Mr. M. Sunseri, President and Chief Executive Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On April 7, 2011, the inspectors presented the inspection results to Mr. M. Sunseri, President and Chief Executive Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials

examined during the inspection should be considered proprietary. No proprietary information was identified.

40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as noncited violations.

- Technical Specification 3.3.2, Table 1, “Engineered Safety Feature Actuation System Instrumentation,” function 6.g., requires, in part, two operable channels of auxiliary feedwater actuation upon trip of all main feedwater pumps in modes 1 and 2. There is no specified required action for two inoperable channels, so limiting condition for operation 3.0.3 is applicable. Limiting condition for operation 3.0.3 requires action to be initiated within 1 hour to place the plant in mode 3 in 7 hours. Contrary to the above, on January 20, 2010, Wolf Creek identified that at various times, the actuation logic function 6.g. for auxiliary feedwater had been inoperable and that the licensee had failed to initiate action within 1 hour to place the unit in mode 3 in 7 hours. Specifically, the actuation logic could not be made up with one main feedwater pump operating and the second main feedwater pump secured and reset. This condition occurred during unit startups and shutdowns. This finding was entered in the licensee’s corrective action program as Condition Report 23008. Using Inspection Manual Chapter 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” the issue screened to a Phase 2 significance determination because it involved an actual loss of safety function. A Phase 2 significance determination using the pre-solved worksheet from the “Risk Informed Inspection Notebook for Wolf Creek Generating Station,” determined the finding was of very low safety significance (Green) because this feature was not credited in the plant’s safety analysis and the auxiliary feedwater safety function was still available.
- Title 10 CFR 20.1501(a) states: “Each licensee shall make or cause to be made, surveys that (1) may be necessary for the licensee to comply with the regulations in this part; and (2) are reasonable under the circumstances to evaluate (i) the magnitude and extent of radiation levels; (ii) concentrations or quantities of radiological materials; and (iii) the potential radiological hazards. On January 4, 2011, a dose estimate was created for welding activities in a locked high radiation area on the 1988’ elevation of the auxiliary building. The dose estimate provided was for the incorrect valve. The incorrect radiation survey data was used for the dose estimate. Additionally, the licensee underestimated the number of workers that would be required for the work. Consequently, the actual dose received was 180 mrem, which was 123 mrem over the dose estimate of 56 mrem. Also, as stated in Section 2RS01, it caused the licensee to fail to recognize that a revised or separate radiation work permit was required for this work activity. Incorrectly evaluating the radiological hazard caused workers’ unintended and unplanned dose. The inspectors determined this finding to be of very low safety significance because it was not associated with ALARA planning or work controls, there was no overexposure, there was no substantial potential for an overexposure, and the

ability to assess dose was not compromised. This issue was documented in the licensee's corrective action program as Condition Report 00031818.

- Technical Specification Table 3.3.2.1, function 8.a, requires two trains of the P-4 interlock to be operable in Modes 1, 2, and 3. Function 8.a does not provide a required action for both trains of engineered safety features actuation system interlocks inoperable. Wolf Creek Technical Specification 3.0.3 requires the plant to be in Mode 4 within 13 hours when there is no required action specified for a limiting condition of operation that cannot be met. Contrary to the above, with both channels of the P-4 input to the Turbine Trip function defeated in Mode 3, Wolf Creek did not take action to place the unit in Mode 4 on November 6-8, 2006, May 10, 2008, April 30, 2009, and November 18, 2009. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened to a Phase 2 significance determination because it involved an actual loss of safety function. A Phase 2 significance determination could not be performed using the "Risk Informed Inspection Notebook for Wolf Creek Generating Station" since the pre-solved worksheet did not address the P-4 interlock. Using a Phase 3 analysis, a senior reactor analyst calculated the core damage probability to be less than 1E-7 per year, or of very low safety significance (Green). This issue was entered in the licensee's corrective action program as Condition Report 23108.

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel

P. Bedgood, Manager, Radiation Protection
R. Evenson, Requalification Program Supervisor
S. Hedges, Site Vice President
S. Henry, Operations Manager
R. Hobby, Licensing Engineer
D. Hooper, Supervisor, Regulatory Affairs
T. Just, Senior Technician, Chemistry
J. Keim, Support Engineering Supervisor
M. McMullen, Technician, Engineering
C. Medency, Supervisor, Radiation Protection
W. Muilenburg, Licensing Engineer
R. Murray, Simulator Supervisor
B. Norton, Manage, Integrated Plant Scheduling
J. Pankaskie, Engineering Supervisor
G. Pendergrass, Director of Engineering
L. Rockers, Licensing Engineer
G. Sen, Regulatory Affairs Manager
R. Smith, Plant Manager
M. Sunseri, President and Chief Executive Officer
J. Truelove, Supervisor, Chemistry
J. Weeks, System Engineer
M. Westman, Training Manager

NRC Personnel

C. Long, Senior Resident Inspector
C. Peabody, Resident Inspector
D. Reinert, Acting Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000482/2011002-01	NCV	Inadequate Design Control of the Fuel Oil Storage Tank Fill System (Section 1R04)
05000482/2011002-02	NCV	Inadequate Clearance Order Isolated Cooling to Inservice Safety-Related Equipment (Section 1R04)
05000482/2011002-03	NCV	Failure to Monitor the Performance of Nonsafety-Related Systems and Components Used in the Plant Emergency Operating Procedures under 10 CFR 50.65 Programs (Section 1R12)
05000482/2011002-04,	NCV	Failure to Follow 10 CFR 50.65 a(2) for Main Control Board Annunciator Power Supply Failures (Section 1R12)

Opened and Closed

05000482/2011002-05	NCV	Inadequate Calculation for Vital Switchgear Cooling (Section 1R15)
05000485/2011002-06	NCV	Failure to Perform an Operability Determination for Degradation of the Fuel Oil Storage Tank (Section 1R15)
05000482/2011002-07	NCV	Failure to Verify Ultimate Heat Sink Sedimentation Levels within Design Bases (Section 1R19)
05000482/2011002-08	NCV	Inadequate Fill and Vent of Component Cooling Water (Section 1R19)
05000482/2011002-09	NCV	Inadequate Clearance Order Disables Power Operated Relief Valve Low temperature Overpressure Function (Section 1R20)
05000482/2011002-10	NCV	Repetitive Failure to Enter Technical Specifications for Auxiliary Feedwater Suction Valve Testing (Section 1R22)
05000482/2011002-11	NCV	Failure to Follow Radiation Work Permit Instructions (Section 2RS01)

Closed

050002009-007-00	LER	Removal of Equipment from Service Required by Technical Specification and NRC Safety Evaluation (Section 4OA3)
050002009-008-00	LER	Potential of Containment Coolers to Have Not Automatically Started in Slow Speed (Section 4OA3)
050002009-009-00, 01	LER	Defeating Feedwater Isolation on Low Tavg Coincident with P-4 Function Results in Missed Mode Change. (Section 4OA3)
050002009-010-00, 01	LER	Failure to meet LCO 3.4B during transition from Mode 4 to Mode 3. (Section 4OA3)
050002009-011-00	LER	Intermediate Range Detector NI 36 Inoperable (Section 4OA3)
050002010-001-00	LER	Automatic Start of Motor-Driven Feedwater Pumps Inoperable During Startup in Mode 1 (Section 4OA3)
050002010-002-00	LER	Turbine Trip Function of Reactor Trip, P-4 Interlock Defeated During Entry Into and in Mode 3 (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1RO4: Equipment Alignment

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
CKL JE-120	Emergency Fuel Oil System Lineup	19
AP 21G-001	Control of Locked Component Status	53B
STN MT-002	Standby Diesel Fuel Oil Storage Tanks Drain and Clean Surveillance TJE01B	4 0
STS PE-021E	Train A Emergency Fuel Oil Transfer System	0
STS PE-021E	Pressure Test	0

DRAWINGS

M-12EC01	Piping and Instrumentation Diagram Fuel Pool Cooling and Cleanup System	19
M-12EC02	Piping and Instrumentation Diagram Fuel Pool Cooling and Cleanup System	7
M-109	Emergency Fuel Oil Stg. Tk. SNUPPS	6
WCRE-03 Tank Documents	Emergency Fuel Oil Storage Tank THE 01 A&B	22
M-13JE02	Piping Isometric Emer. Fuel Oil Sys. – “Train A” Diesel Generator Building	7
M-13JE01	Piping Orthographic Emergency Fuel Oil System (Below Grade)	4
USAR Figure 9.5.4-1-00	P&ID Emergency Fuel Oil System	19

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SY1406400	Lesson Plan: Fuel Oil Purpose, Power Supplies, Layout	8
Control Room Logs	IOD: B EDG FUEL OIL USAR Chapter 9.5.4	0

02-004	USAR Change Request	
07948	CCP Engineering Disposition: correct seismic class on M-12JE01	0
10153	CCP Engineering Disposition	3
11-337160-001	Engineering Disposition: ¾ Diameter Tubing from Main Supply to a Header (KKJ01B)	0

Work Orders

10-323952-00 00-223036-000

Condition Reports

00032348 0033327 2008-004248

Section 1RO5: Fire Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AP 10-106	Fire Preplans	7

Section 1RO6: Flood Protection Measures

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AP 21B-003	Control of Non-Plant Items Inside the Plant	8
AP 10-102	Control of Combustible Materials	15

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
09-005-XX-01	Temporary Modification Order	February 19, 2011
E-029-00023	Scotch Super 33+ Vinyl electrical Tape Data Sheet	W01

Condition Reports

00033842 00033847 00033959

Work Order

08-311356-020

Section 1R07: Heat Sink Performance

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
STN PE-033	CCW Heat Exchanger Performance Test	March 3, 2009
STN PE-033	CCW Heat Exchanger Performance Test	October 8, 2009

Section 1R11: Licensed Operator Requalification Program

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
GEN-00-005	Generator Load to Hot Standby	67
GEN-00-006	Solid Pzr Ops	
LR4132601	Simulator Lab Training Materials	000

Section 1R12: Maintenance Effectiveness

Condition Reports

00020665	00034681	00034650	00034529	00033909
00033896	00010657	00025817	00016581	00019447
00019390	00016504	00016467	00033465	00033594
00033562	00030432	00033823		

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EDI 23M-050	Engineering Desktop Instruction Monitoring Performance to Criteria and Goals	3
STS KJ-005A	Manual/Auto Start, Sync & Loading of EDG NE01	54

PROCEDURES

NUMBER

TITLE

REVISION

MISCELLANEOUS

NUMBER

TITLE

AD-04	Final Scope Evaluation for Condensate System Function to Provide Water to the Suction of the Main Feedwater Pumps
AE-01	Final Scope Evaluation for Feedwater System Function to Provide Feedwater and Controls to the Steam Generators
AE-04	Final Scope Evaluation for Feedwater System Function to Provide Feedwater and Controls to the Steam Generators (startup feed pump)
KA-01	Final Scope Evaluation for Compressed Air System Function to Provide a Continuous Supply of Dry Oil-Free Air for Pneumatic Instruments and Valves
NF-01	Final Scope Evaluation for Load Shedding and Emergency Load Sequencing System Function to Shed and/or Sequence Selected Loads from and/or to the Class 1E Buses
PA-01	Final Scope Evaluation for the Higher Medium Voltage System 13.8kV Function to Distribute 13.8kV Power to Various Loads Via Two Buses
PB-01	Final Scope Evaluation for the Lower Medium Voltage System 4.16kV (Nonclass IE Power System) Function to Provide Transformation of Power from 13.8kVac to 4.16kVac and Distribute that 4.16kV Power to Supplied Loads
PG-01	Final Scope Evaluation for the Low Voltage System – 480V (Nonclass IE Power System) Function to Provide Transformation of Power from 13.8kVac to 480Vac and Distribute that Power to Supplied Loads
PK-01	Final Scope Evaluation for 125Vdc System (Nonclass IE Power System) Function to Provide 125Vdc Power to Various Plant Loads for Control and Switching of Nonclass 1E Electrical Systems
RK-01	Final Scope Evaluation for Plant Annunciator System Function to Provide the Control Room Operator a Visual and Audible Plant Status Condition

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
SL-01	Final Scope Evaluation for Site Auxiliary Power System Function to Provide ac Electrical Power to Service Water, Circulating Water, and Fire Protection Systems	

Work Orders

10-330047-000	10-330048-000	10-330049-000	10-331141-000	10-331148-000
10-331182-000	10-332898-000	10-332907-000	10-332894-000	09-316986-000
11-338443-000	11-338329-000	10-328341-000	10-328341-001	09-317354-000
09-317354-001	09-314014-000	08-312488-000	10-329847-001	09-320710-000
09-320710-001	09-318024-000	09-313998-000	09-313269-000	08-313088-000
08-313088-005	08-311453-000	10-336499-000	10-334406-000	10-328821-000
10-328821-001	10-326492-000	10-326377-000	08-310332-000	08-308271-003
08-304334-000	08-303649-000	08-303649-001	10-331046-000	10-325812-000
09-319777-000	09-318534-000	10-332636-000	10-332636-001	10-332636-002
10-328064-000	09-320189-000			

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AP 22C-003	On-Line Nuclear Safety and Generation Risk Assessment	15A
ALR 00-131B	Generator Field Overvoltage	8
ALR 00-131C	Voltage Regulator Trip to Manual	6
ALR 00-131D	Generator Voltage / Hertz Excess	10
STN AC-004	Quarterly Turbine Test	14A
SYS AC-120	Main Turbine Generator Startup	74
TSTF-IG-06-01	Implementation Guidance for TSTF-358, Missed Surveillance Requirements	6
TSTF-358	Industry/TSTF Standard Technical Specification Change Traveler	6
	Technical Specification SR 3.3.2.10, Table B 3.3.2-2 Functional Unit 13	
	Technical Specification B 3.0-13, -14	34
	Technical Specification 3.0-4	173
PSA-11-001	PSA Risk Evaluation of Incomplete Surveillances Tests STS	0

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	AL-005, STS IC-740A and STS IC-740B (CR 33352)	
AP 26C-004	Operability Determination and Functionality Assessment	21
	Calculation No. AN-02-006	0
M-724-00409	Instruction Manual for Gate and Check Valves	W13
MGE LT-009	Limiterorque Geared Limitswitch Adjustment	8A

DRAWINGS

E-13BN03A	Refueling Water Storage Tank to RHR Pump MOV	8
E-13EJ06A	Sump to No. 1 Residual Heat Removal Pump	7
E-13EJ06B	Sump to No. 2 Residual Heat Removal Pump	9
EJHV8811A	CTMT Recir Sump to RHR Pump A Suction ISO	0
EJHV8811B	CTMT Recir Sump to RHR Pump B Suction ISO	0
BNHV8811A	RWST to RHR PMP A Suction ISO	W13
BNHV8812B	RWST to RHR PMP B Suction ISO	W13
44C308703	Alterrex Excitation System with S.C.R. Regulator	8

Condition Reports

00033352 00033717 00031929

Work Orders

08-310457-000 08-308676-001 08-308675-001 11-336846-001

Section 1R15: Operability Evaluations

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
OFN-SG-003	Natural Events	20
	BGV0192 to BGV0195 RWST Interface Piping	0
JE-M-003	Emergency Fuel Oil Storage Tanks Access Vaults Minimum Temperature	00
STS CH-015	Emergency Diesel New Fuel	23
STS KJ-005A	Manual/Auto Start, Sync & Loading of EDG NE01	54

Section 1R15: Operability Evaluations

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
STS MT-011	Snubber Visual Examination	18
SYS KJ-200	Inoperable Emergency Diesel	23A
CHS KJ-D01	Sampling Emergency Diesel A & B Fuel Oil System	1A
ASME B&PV Code	Section XI – Subsection IWF Requirements for Class 1, 2, 3 and MC Component Supports of Light Water Cooled Plants	1998
MC8571	NRC Safety Evaluation, 3 rd 10 Year Interval Inservice Examination Program for Snubbers Relief Request I3R-03	June 2, 2006
RER 2010-106	Broken Smith Blair Coupling Flange	February 15, 2011

Work Order

10-331864-000

Condition Reports

00010832	00015385	00010833	00020515	00024818
00032420	0003718	00033730	00033953	00033486
00033653	00033758	00025988	00031020	

Section 1R19: Postmaintenance TestingCALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
Z065-C-001	Calculation Subject: Evaluation of Annual UHS Sedimentation Measurements	10
CCP 011149	Revise Surveillance Frequency for SR Water Control Structures and Reservoir (C-404)	0

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
C-302	Specification for Suction Dredging the Ultimate Heat Sink	2
C-302	Specification for Suction Dredging the Ultimate Heat Sink	3

Section 1R19: Postmaintenance Testing

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
M-021-089-04	MDAFW A Pump Flow-Head Curve	
OE AL-09-013	MDAFWP Total Discharge Flow Above 800gpm	0
PO: 750835/0	2010 Wolf Creek UHS Reservoir Hydrographic Survey	August 20, 2010

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
AP 10-103	Fire Protection Fire Impairment Control	23A
SYS FP-293	Fire Pumps Manual Operation	15
STN FP-211	Diesel Fire Pump1FP01PB Monthly Operation and Fuel Level Check	21A
EF-M-021-000-CN001	Calculation Change Notice	December 13, 2005
EFHV0039	30" Butterfly SMB-00-25	
AP-16E-002	Post Maintenance Testing Development	9C
STN AE-007	Startup Main Feedwater Operational Test	0A
STS AL-101	MDAFW Pump A Inservice Pump Test (Completed)	January 10, 2011
SYS AL-120	MDAFW or TDAFW Pump Operations (Completed)	January 6, 2011
AP 29B-003	Surveillance Testing	11
TMP 04-016	Dredging the UHS	0
MPM KJ-004	Robertshaw Model 1285 Temperature Control Valve	2

Condition Reports

00034331	00034806	00034500	00034434	00027080
00027220	00027243	00027144	00027196	00031876
00021559	00021630	00031853	00031848	00031820
00031819	00032573	00031863	00032582	00032584
00032586				

Work Orders

11-338679-000	11-338679-001	11-338679-002	11-338509-000	11-338509-001
10-331117-003	10-331117-001	10-332847-000	10-332847-002	09-322525-001
10-335457-001	04-262017-000	02-233644-000	09-322079-000	09-322079-001
09-322079-002	11-336729-000	09-322079-006	06-248742-000	06-289298-000
09-318482-000	10-325693-000	10-332582-000		

Section 1R20: Refueling and Other Outage Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
GEN 00-004	Power Operation	65
GEN 00-005	Minimum Load to Hot Standby	67
GEN 00-006	Hot Standby to Cold Shutdown	76
AP 21E-001	Clearance Orders	27
SYS-SB-120	Enabling/Disabling of SSPS	9

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
R-SB-A-004	Clearance Order	March 22, 2011
10-328830-001	Clearance Order Worksheet Audit Report	March 30, 2011

Condition Reports

00035318 00035288

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
STS AL-103	Turbine Driven AFW Pump Inservice Test	45
STS EM-100A	Safety Injection Pump A Inservice Pump Test	04A
STS RE-009	Heat Flux Hot Channel Factor Measurement (Completed)	January 14, 2011

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
STS RE-013A	Incore-Excore Detector Axial Flux Difference Comparison (Completed)	January 14, 2011
STN EM-100A	Safety Injection Pump A Reference Pump Curve Determination	3
STS PE-061	Control Room Control Building Habitability Test	0
STS IC-202A	Channel Operational Test of Tavg, dT and Pressurizer Pressure Protection Set Two	22A

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
CCP 013427	Broken Wires in Containment Tendons V7 and V65	00
WC-N1054-002	Wolf Creek Generating Station 7 th Period – 25 th Year Containment Building Tendon Surveillance	June 22, 2010
WC-N1054-500	Final Report for the Wolf Creek Nuclear Plant 25 th Year Containment Building Tendon Surveillance	December 6, 2010
WCGS Special Order 26	Administrative Requirements for Technical Specification Required Actions for Transient Relaxed Axial Offset Control FQW(Z) Not Within Limits	1
	Accelerated Atmospheric Tracer Depletion (ATD) Testing for Unfiltered Air In-Leakage Determination at the Wolf Creek Nuclear Power Plant	February 28, 2011

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
1000872.511	Wolf Creek B-Train M-15EF01	September 10, 2010
1000872.501	Wolf Creek A-Train M-15EF01	September 1, 2011
M-744-00042	Reactor Protection System Engineered Safety Features	W11

Condition Reports

00033477 00033908 2006-002097

Section 1EP6: Drill Evaluation

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
11-SA-01	Wolf Creek Emergency Planning Drill Scenario	January 11, 2011

Section 2RS01: Radiological Hazard Assessment and Exposure Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AP 19B-001	Failed Fuel Action Program	7
AP 19D-100	Radioactive Source Program	4
AP 25A-001	Radiation Protection Manual	14
AP 25A-200	Access to Locked High or Very High Radiation Areas	24
AP 25A-700	Use of Temporary Lead Shielding or Locked High Radiation Areas and Very High Radiation Area Barricades	12
AP 25B-100	Radiation Worker Guidelines	40
RPP 01-105	Health Physics Organization, Responsibilities, and Code of Conduct	13
RPP 02-210	Radiation Survey Methods	37
RPP 02-215	Posting of Radiological Controlled Areas	26A
RPP 02-405	RCA Access Control	17
RPP 02-515	Release of Material from the RCA	26
RPP 02-605	Control and Inventory of Radioactive Sources	14
RPP 08-105	Underwater Dive Operations	8
STS HP-001	Sealed Source Contamination Surveillance Test	22

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
10-09-PC	Quality Assurance Audit Report Process Control Program	November 18, 2010
10-03-RP	Quality Assurance Audit Report Radiological Protection Program	March 18, 2010
SEL 2010-176	Self Assessment Report SEL 2010-176 "HP Operations/Instrumentation"	June 24, 2010

CONDITION REPORTS

00025491	00027545	00031818	00034013	00035289
00035392	00035396	00035408	00035500	00035519

RADIATION WORK PERMITS

<u>NUMBER</u>	<u>TITLE</u>
110008	NRC Access to the RCA
110060	Underwater Vacuum Filter Removal from Spent Fuel Pool
111001	Operations Rover RWP for pre-RF-18 and RF-18 Activities
111101	Under RV Cavity Seal Ring Access for RF-18
111102	Incore Tunnel Inspections & Maintenance
112600	Routine Outage Access (No High Radiation Areas Access)
112601	Routine Outage Access (No Locked High Radiation Areas Access)
112602	Routine Outage Access (No Very High Radiation Areas Access)
113022	Eddy Current Testing of Incore Flux Thimble Tubes at Seal Table
113220	Primary Side Steam Generator Secondary Side Work
116020	RV Head Preparation
116031	RV Head Lift, Transfer, & Set

SURVEYS

1101-0028	1101-0040	1101-0041	1101-0052	1101-0055
1101-0197	1101-0198			

Section 2RS02: Occupational ALARA Planning and Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AI 02-005	Primary and Radwaste Guidelines for Plant Startup and Shutdown	2
AP 25A-001	Radiation Protection Manual	14
AP 25A-401	ALARA Program	18
AP 25A-410	ALARA Committee	15
AP 25B-300	RWP Program	21
RPP 02-105	RWP	35

CONDITION REPORTS

00025510	00025923	00026060	00030234	00031460
00033762	00034013			

RADIATION WORK PERMITS

<u>NUMBER</u>	<u>TITLE</u>
111000	Health Physics Rover Coverage RF-18
113220	Primary Side Steam Generator Secondary Side Work
114200	Steam Generator Secondary Side
114208	RCP Team Work Activities Reactor Vessel Head Lift Preparation and Post Head Set Work Activities
114420	RV Head Lift, Transfer, & Set Scaffolding Erection/Removal
116020	RV Head Preparation

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>DATE</u>
ALARA Report Refuel 17	August 30,2010
ALARA Committee Meeting	November 16, 2010
ALARA Committee Meeting	December 14, 2010
ALARA Committee Meeting	February 08, 2011
ALARA Committee Meeting	March 08, 2011
ALARA Long Range Source Term Reduction Plan 2010-2015	November 18, 2010

Section 2RS03: In-plant Airborne Radioactivity Control and Mitigation

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AI 14-009	Industrial Respiratory Protection Program	5A
AP 25B-600	Respiratory Protection Program at Wolf Creek	7
AP 25A-800	Use of Vacuum Cleaners in the RCA	4A
RRP 05-205	Eberline AMS-4 Operation	8
RRP 05-920	RCA Vacuum Cleaner Maintenance	5
RRP 05-925	HEPA Portable Ventilation Unit Maintenance and Use	6

Section 4OA1: Performance Indicator Verification

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
APA 26A-2007	NRC Performance Indicators	8

OTHER DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
SEL 2010-188	Self-Assessment Report	November 18, 2010

CONDITION REPORTS

19369 19913 25817

Section 4OA3: Event Follow-Up

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AP 26C-005	Technical Specification LCO 3.0.4 Mode Change Review	0

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
EA-09-326	Response to Disputed Noncited Violations in NRC Inspection Report 05000482/2009004 and Withdrawal of Noncited Violation	March 4, 2010

Condition Reports

00022483	00030918
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